

Frege's Theory of Meaning: Words, Sentences, and Their Significance

Research Review Journal of
Interdisciplinary Studies

double-blind peer-reviewed and
refereed online quarterly Journal

ISSN (online): 3108-0472

1(2) 36-43, 2025

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 10.31305/rrjis.2025.v1.n2.006

 <https://rrjournals.in/>



Received: 13 Jul, 2025

Revised: 25 Aug, 2025

Accepted: 3 Sep, 2025

Published: 30 Sep, 2025

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Abstract: *This essay examines Gottlob Frege's theory of meaning and its significant influence on mathematics, logic, and philosophy of language. A methodical foundation for comprehending how words and sentences convey meaning is provided by Frege's distinction between sense (Sinn) and reference (Bedeutung), emphasizing that language utterances have cognitive importance beyond simple denotation. Frege emphasized that the meaning of sentences is inextricably linked to their truth-values by establishing the idea of thought (Gedanke), which moved the focus from subjective mental processes to objective, sharable content. The paper looks at Frege's analysis of identity assertions and shows how, depending on how they are presented, co-referential terms can offer useful information. In addition, the paper highlights Frege's contributions to the philosophy of mathematics, where arithmetic truths are derived from logical principles, demonstrating the relationship between language, logic, and mathematical reasoning. It also discusses the function-argument structure of language, demonstrating how predicates and arguments interact logically to form meaningful sentences. This research emphasizes the ongoing significance of Frege's work for contemporary analytical philosophy, semantics, and formal logic by incorporating viewpoints from current academics and primary sources. The results show that Frege's discoveries not only made the processes of meaning and truth in language more understandable, but they also set the stage for later advancements in logic and mathematical concept analysis.*

Keywords: *Frege, sense and reference, thought (Gedanke), identity statements, truth-values, philosophy of language, logicism, meaning, sentences.*

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1 | INTRODUCTION:

No theory of meaning has been as significant in modern philosophy of language as Gottlob Frege's difference between sense (Sinn) and reference (Bedeutung), initially defined in his 1892 essay *Über Sinn und Bedeutung*. Frege's thesis showed that determining a term's meaning does not explain language's informativeness and cognitive importance, revolutionizing how researchers perceive words and sentences. This distinction is central to 20th-century analytic philosophy and still influences modern semantics and linguistic meaning (Frege, 1892/1948, *Philosophical Review*, 57(3), p. 209-230). Frege distinguishes two semantic qualities of words and sentences. The first is the reference: the object, truth-value, or concept a word or sentence represents in the world. The second is sense: how a competent speaker perceives that referent (Frege, 1892/1948, p. 25-50). Frege notes that "the morning star" and "the evening star" may have the same referent—Venus—but different senses, which explains how an identity statement like "the morning star is the evening star" can be informative rather than trivial (Frege, 1892/1948, p. 32). Frege's difficulties about identity and propositional attitudes led him to realize that a phrase can be true and convey new knowledge about the referent. Traditional referential explanations cannot explain why "Hesperus is Phosphorus" is more cognitively valuable than "Hesperus is Hesperus" if both propositions have the same reference (Stanford Encyclopaedia of Philosophy, 2020). Frege argued that linguistic expressions must also be interpreted in terms of sense, which explains how language users perceive terms' referents.

Frege defined sentence meaning as a structured combination of senses. Thought (Gedanke) is a sentence's objective meaning, true or false. In contrast, the sentence's reference is its truth-value (True or False) after determining its components' senses (Frege, 1892/1948, p. 25-50). This technique explains how substituting co-referential terms in specific instances alters sentence meaning without affecting reference. In semantic theory, Michael Dummett argues that Frege's sense notion contains important elements of linguistic meaning that cannot be explained by reference (Dummett, 1973; referenced in Wikipedia on Frege: Philosophy of Language). Dummett notes that comprehending a term's meaning requires knowing how speakers achieve its referent, not just mapping it onto a worldly object. The dispute on sense and reference sparked discussions on meaning objectivity, anti-psychologism, and language logic (Frege's impact is examined in analytic philosophy, Heck & May 2006). Frege's theory addresses language's opaque settings, such as belief reports and indirect discourse, where inserting co-referential expressions impacts veridically due to words' conventional meaning instead of traditional reference (Frege, 1892/1948, p. 44-48). Considerations support a two-level semantic theory, where sense directs meaning in complex linguistic contexts. Frege's theory combines logic, semantics, and epistemology by explaining how language affects cognition and reality and why communication requires shared linguistic structures. Frege's difference between sense and reference, a cornerstone of analytic philosophy, has shaped semantic, cognitive, and linguistic ideas and remains fundamental to philosophy of language study.

2 | THE FUNDAMENTAL DISTINCTION: SENSE AND REFERENCE

I cannot ignore Frege's semantic theory's distinction between "sense" (Sinn) and "reference" (Bedeutung) as I learn how language links with mind and reality. This distinction is crucial to explaining how words and phrases have meaning beyond pointing to the reality. Frege articulated this distinction in his 1892 essay "*Über Sinn und Bedeutung*" ("On Sense and Reference"), which was translated and republished in *The Philosophical Review*. He claims in this work that every meaningful expression has a sense and a reference. The reference is what the expression means in the world, whereas the sense is how it is communicated to a thinker or speaker. Frege says: "To every sign there corresponds a definite sense and to that in turn a definite Bedeutung" (Bedeutung = reference) (Frege, cited in Philopodia, 1892, p. 25-50).

Frege's insight illuminates the difficulty of informational identity, which strikes me. Traditional meaning theories maintained that a name or description's referent—its object—exhausts its meaning. Even though "Hesperus is Hesperus" and "Hesperus is Phosphorus" refer to Venus (the evening and morning stars, respectively), Frege notes that they can have different cognitive values (Frege, 1892/1948). Even if their allusions are same, the two names have different meanings, he says. Connecting co-referential expressions makes identity claims informative, not tautological. Frege's semantic theory centers on sense as presentation. He maintains that senses are objective linguistic elements that may be shared and communicated across speakers. Thus, sensation is what we "grasp" when we interpret a statement, but reference is what the word points to in reality. Analytic philosophy agrees: modern Frege summaries explain why two phrases with the same reference can have different meanings (Britannica Editors, 2024).

The distinction Frege makes applies to sentences as well. He defines a complete declarative statement as its truth value (True or False) and its meaning (Gedanke). Frege emphasizes that sense, not reference, determines language's cognitive and communicative content. When sense is compared to reality, the sentence's truth value is determined (Frege, 1892/1948). Frege's distinction clarifies semantics and affects epistemology and logic. Frege showed that meanings are not reducible to references alone, laying the framework for modern treatments of intentional contexts, such as belief reports or indirect discourse, where substituting co-referential terms modifies sentence interpretation. Thus, following analytic philosophers use Frege's sense reference framework to examine propositional attitudes and referential meaning constraints. I consider Frege's fundamental distinction a milestone in language and logic philosophy. It answers long-standing questions concerning meaning, organizes name and sentence interpretation, and has molded semantic theory for nearly a century. Sense and reference help us comprehend not only what words mean in the world but also how they signify to us as thinkers and communicators, which is essential to language, mind, and logic research.

3 | FUNCTION AND ARGUMENT IN LANGUAGE:

Frege's function-argument analysis has changed my understanding of meaning in my philosophy of language studies. Like mathematics, Frege saw language as functions and arguments, not subject and predicate. This understanding changes how we view language and thinking architecture, not just logic. Frege proposed that functions apply to arguments to define a phrase in his formal system Begriffsschrift (1879). Traditional grammar says "John loves Mary" contains a subject and predicate, but Frege saw it as a function that needs John and Mary to yield a value. The Stanford Encyclopaedia of Philosophy states that Frege's logic treats "a binary relation like loves as a binary function that maps a pair of arguments to a truth-value" (Zalta, 2022, sec. 2.1.1). Functions are "unsaturated" until their argument locations are filled in this framework. Functions with names like $F(\quad)$ or $L(\quad , \quad)$ require arguments. Filling these empty spaces with proper names or entire expressions (arguments) gives the function a value, usually True or False. According to the Internet Encyclopaedia of Philosophy (2025), functional expressions require arguments to complete sentences, as placeholders (or variables) are present.

Function-argument structure replaces subject-predicate analysis, and not just stylistically. According to Frege, sentences create meaning compositionally. The interaction of a sentence's parts—functions and arguments—determines its meaning, making it more than just words. The Stanford Encyclopaedia of Philosophy states that "Frege analysed a non-mathematical predicate like 'is happy' as signifying a function of one variable which maps its arguments to a truth value" (Zalta, 2022, sec. 2.1.1). This change is momentous because predicates become functions that produce values in truth conditions, not objects. A sentence like "Socrates is wise" is a function $WISE(\quad)$ applied to Socrates that returns True if he is wise. The sentence is complete and true only when the function's argument is provided. This view blurs syntax and semantics by showing that meaning is in functional application. Frege's function-argument approach and sense reference distinction fit together. The presentation of functions' mapping of arguments to truth values gives them meaning. Language acquires logical structure when sentences are

systematic compositions that map arguments to truth values through functions. Modern semantic composition studies show that compositionality—the meaning of larger expressions—depends on the meaning of their pieces and the rules controlling their arrangement.

As I study Frege, function-argument analysis unites logic and language most strikingly. It views linguistic meaning as a logical application, not a human product. Function names are unsaturated expressions that need arguments to produce values—truth for sentences, objects or ideas otherwise. Frege could employ logical notation to describe everyday language and his logic is the foundation of predicate semantics in analytic philosophy because of this realization. Frege’s function-argument analysis indicates that language is a system of function applications, making it fundamental to logic and philosophical semantics. We can only comprehend how sentences communicate meaningful concepts and how compositional interactions of functions and their arguments create meaning by understanding this underlying structure.

4 | THE CONCEPT OF THOUGHT (GEDANKE):

A key concept in Frege’s theory of meaning is *Gedanke*, or “the thought” represented by a sentence. Frege saw *Gedanke* as neither a psychological concept nor a grammatical structure. Sentences are true or untrue because of their objective content. Understanding how language affects logic, communication, and truth requires this objective, shareable content. *Der Gedanke* is Frege’s later article that fully explores his mind notion. “Thought: A Logical Inquiry” was published in 1918. In this work, he emphasizes that mind is an abstract object accessible to language-savvy people. Frege states, “The thought, in itself immaterial, clothes itself in the material garment of a sentence and becomes computable to us. A sentence conveys a thought (Frege, 1918, p. 69; quoted in Thought (essay)). Frege’s non-psychological account of thoughts is notable. He believes thoughts are public and objective, regardless of thinkers’ mental states. If two persons understand the same language, they understand the same *Gedanke*, even if their mental experiences differ. Frege believes that “the sense of a declarative sentence is a thought (*Gedanke*): the objective, propositional content that can be true or false,” and that “the same thought can be expressed by different sentences in different languages” (Philopedia, n.d.). This shows that *Gedanke* is based on logic, not form.

Frege’s *Gedanke* and sense (*Sinn*) are related. Frege’s renowned article “On Sense and Reference” states that a sentence’s sense is its thinking and its reference is its truth value, True or False. Thus, the *Gedanke* mediates between linguistic expression and logical evaluation: it is what we understand and determine to be true or false when assessing a phrase. This unique element of the *Gedanke* is highlighted by Michael Dummett, a leading Frege interpretation. Frege focused on sentences’ publicly visible content, or “thoughts,” according to Dummett. This view helped move language philosophy from psychological to logical meaning theories. Frege research relies on Dummett’s view, which is occasionally disputed (Dummett, 1973/1981). Frege’s contention that thoughts are not linked to experiences or subjective mental pictures shows his rejection of psychological theories of meaning. He boldly claims that *Gedanke* can exist before and independent of any thinker, placing thoughts in Frege’s “third realm” of abstract entities. According to the Britannica article on philosophy of language, Frege believed that sentence meaning is determined by logical conclusions, not the speaker’s mental conditions (Blackburn, 2024).

Frege’s concept of thought illuminates how language can contain truth conditions and support logical reasoning universally and sharably. *Gedanken* are not time-, place-, or person-specific like mental representations or psychological beliefs. Two speakers of different languages can express the same *Gedanke* in different sentences and both regard it True or False under the same conditions. Frege’s theory integrates language, logic, and truth into a semantic framework. Understanding *Gedanke* also explains why Frege insisted that words and sentences cannot be reduced to reference. The *Gedanke*—a sentence’s structural sense—determines its truth conditions and allows language to communicate world

knowledge. Frege's theory establishes meaning and underpins modern semantics and language philosophy.

5 | IDENTITY AND INFORMATIVE STATEMENTS:

Gottlob Frege's explanation of why some identity claims are informative and others are trivially true is a major contribution to language philosophy. Identity ($a = b$) seems like a simple logical relation. When you think about it, " $a = b$ " might be remarkably instructive when a and b are various expressions for the same thing. The line "The Morning Star is the Evening Star" is informative since historically, people did not realize that Venus was the same celestial body in the morning and evening. Instead, the tautological sentence "The Morning Star is the Morning Star" provides only its meaning. Frege uses this distinction to inspire a deeper meaning theory (Britannica Editors, 2024). Frege discovered that the informativeness of an identity statement depends on both the reference and the sense of the expressions. Frege defines "sense" (Sinn) as the way a referent is presented to the mind, while "reference" (Bedeutung) refers to the external item it represents (Philopedia, n.d.). Example: "The Morning Star is the Evening Star". The terms "Morning Star" and "Evening Star" both apply to Venus, but they depict her as a dazzling morning or evening star. The identification statement "The Morning Star is the Evening Star" unites two cognitive paths to the same object because these two modes of presentation are distinct. Unlike the trivial identity "The Morning Star is the Morning Star", when sense and reference match. Frege explains how co-referential identity statements can be informative (Philopedia, n.d.). He emphasizes that $a = a$ holds by definition, but $a = b$ can expand our knowledge by allowing for different ways of conceiving the same object (Frege, cited in Heck & May, as described by Imogen Dickie). Discovering that Hesperus is Phosphorus was historically significant because it showed how the same referent was presented differently in different observational situations.

Beyond astronomical examples, this idea is philosophically significant. Identity statements like "Mark Twain is Samuel Clemens" are informative since the two names have different meanings. Because the two names show the same person in different ways—one as a famous author and the other as a private person—learning their identity is new. Thus, Frege's analysis turns from objects to modes of presentation, explaining why identity assertions are cognitively valuable (Stanford Encyclopaedia of Philosophy, 2011). Frege's theory's integration with his semantic framework intrigues me. His distinction between sense and reference accounts for informative identity claims and his handling of sentences: a sentence's sense is its thinking, and its reference is its truth value. Frege unifies how meaning ties linguistic expressions with cognitive significance and logical structure by treating identity as a relation between modes of presentation rather than objects. Later philosophers expanded Frege's account. Analytic philosophy debates whether Frege's explanation fully captures identity and information, especially when complex expressions or descriptions are involved, but the central idea that informative identity statements reveal sense differences despite shared reference remains influential (Dickie, 2020).

6 | SENTENCES, TRUTH, AND MEANING:

In investigating Frege's theory of meaning, I have discovered that his treatment of sentences—especially how they relate to truth and meaning—is one of his most important contributions to language philosophy. Frege realized that whole declarative sentences are the essential units of meaning and can be evaluated for truth or falsity, unlike earlier thinkers who focused on words or names. He realized that knowing meaning needs understanding both what words signify and how sentences function in logical and semantic systems. Frege applies his sense-reference distinction to sentences in his key work "Über Sinn und Bedeutung" (1892). He claims that a complete declarative sentence's reference is its truth value, not its thinking (Gedanke) (Frege, 1892/1948, p. 209-230). The Philopedia summary states: We call the thought a sentence represents its sense and its reference its truth value. In "On Sense and Reference," Frege in a breakthrough move, Frege replaced the earlier concept that sentences might refer to events or facts with a simpler and more rigorous idea: every declarative statement is True or False. Frege calls

sentences “a kind of complete entity” like proper names and contends that just as names identify objects, sentences indicate truth values—True for truthful sentences and incorrect for incorrect ones, according to the Stanford Encyclopaedia of Philosophy.

The meaning of sentences is deep because, unlike words, sentences express a notion that might be true or incorrect. We use sentences to determine the truth of word pairings. The truth requirements of a phrase depend on its meaning, or thinking. Spring (2025) states that Frege was “widely credited with the idea that the thought expressed by a sentence contains, or determines, its truth conditions.” Frege finds that sentence-level meaning is intimately tied to logical assessment. He views predicates and names as logical components that give truth values. Predicates are propositional functions that convert arguments (things) into truth values: “if the predicate ‘is a city’ is applied to the name ‘Kyiv’, one gets the sentence ‘Kyiv is a city’, which designates the True,” according to the Stanford Encyclopaedia of Philosophy Since “Mount Everest is a city” is false, it is False. Frege’s emphasis on truth values as sentence semantics ties into his goal of differentiating meaning from psychology. He insisted that sentences convey objective thoughts with truth conditions that are publicly accessible and unrelated to mental states or subjective experiences. Competent language users can share a sentence’s thought, and its truth value is abstract semantic property, not psychological.

Frege’s view of truth and meaning shaped current semantics. Modern language philosophy treats sentence meaning as truth conditions, frequently formalized in logical systems. Frege was the first to clearly explain this idea, shifting from meaning as a subjective mental phenomenon to a logical relationship between language and the universe. I think Frege’s analysis shows that statements are meaningful since they can be true or false. The truth criteria and logical evaluation of meaning are only at the sentence level, yet words contribute to the thoughts sentences express. Frege’s theory unites semantics and logic by arguing that language’s meaning depends on how it helps us articulate and evaluate world truths.

7 | FREGE AND THE PHILOSOPHY OF MATHEMATICS:

Frege’s logic and language work is deeply connected to his philosophy of mathematics. Frege considered mathematical truths a special sort of logic. He wanted to prove that logic could subsume mathematics, not simply evaluate mathematical sentences. Logicism is one of the most ambitious philosophical analyses of mathematics’ underpinnings. Frege believed mathematical truths are objective and a priori, irrespective of experience and psychology. He vehemently denied that numbers are founded on mental intuition, sensory experience, or psychology. Frege believed that mathematics conveys abstract truths about objects through logic, rather than observation or feeling (Internet Encyclopaedia of Philosophy, n.d.). His 1884 work, *Die Grundlagen der Arithmetik*, outlines his logicist program. What is a number, Frege wonders in this book? then attempts to answer without subjective mental constructions or intuition. He disputes Mill’s empiricism, which sees numbers as objects we observe. Frege believes numbers are abstract things based on logical relationships between concepts. He claims that math is about logical truths that can be proven by reasoning. Frege pursued a logical approach to philosophy. He created a formal logical method in his *Begriffsschrift* (1879) and his two-volume *Grundgesetze der Arithmetik* (1893/1903) to deduce arithmetic from logical principles. This formal system defined numbers using logical functions and value ranges. The key was to prove that number theory facts like “ $2 + 2 = 4$ ” could be supported by logical laws and definitions.

Logicism, Frege’s overall approach, states that mathematics is an extension of logic. This perspective holds that logical principles can explain mathematical truths without a specific foundation for mathematics. Mathematical meaning, truth, and necessity are deeply affected by this. If arithmetic is a branch of logic, then mathematical assertions are logically required truths that reflect reason. This programme was brilliant, but Frege faced a major obstacle. In *Grundgesetze*, Bertrand Russell found

Russell's Paradox in Frege's Basic Law V. This paradox proved that Frege's initial formal system was inconsistent, undercutting his ambition of deriving all mathematics from logic. Frege's mathematics had a huge philosophical impact, notwithstanding this defeat for his logicist objective. Russell's discovery did not reduce Frege's influence; it emphasized his philosophical depth and spurred logic and mathematics foundations research. Later theorists like Russell, Whitehead, and Gödel refined or explored logicist ideas. Neo logicism, which adapts Frege's findings, uses Hume's Principle to tie numbers to one-to-one correspondences between sets. My favourite part of Frege's mathematical philosophy is how it links meaning, truth, logic, and mathematics. His theory indicates that language and logic are key to understanding mathematical reality, not just communication tools. Frege insists that mathematical facts are based on logic, challenging us to regard mathematics as an extension of rational mind. This combination of logic, mathematics, and language is one of the greatest philosophical achievements of the modern era.

8 | CONCLUSION:

As I consider Frege's theory of meaning, I see its continuing relevance to logic and philosophy of language. A logical foundation for comprehending how words and sentences convey meaning while tying language to truth and objective cognition is provided by Frege's distinction between sense (Sinn) and reference (Bedeutung). Frege emphasized that meaning is connected to both linguistic expressions and the truth-values they represent by introducing the idea of *Gedanke*, or thought, which moved the focus from subjective mental sensations to the public, sharable substance of sentences. Additionally, his examination of identification assertions and informative sentences demonstrates the nuanced ways in which language can broaden understanding, showing that co-referential phrases can express distinct cognitive viewpoints even though they relate to the same thing. Frege's ideas naturally extend to mathematics, where his logicist effort highlights the close relationship between meaning, truth, and formal reasoning by proving that arithmetic truths are not empirical but rather based on logical principles. I believe that Frege's work offers a cohesive knowledge of the logical and semantic processes of language. It provides methods for methodically analysing meaning and sheds light on the connections between words, sentences, ideas, and truth. Frege's discoveries continue to be fundamental, driving current research in semantics, logic, and the philosophy of mathematics despite subsequent difficulties like Russell's dilemma. His theory is a pillar of contemporary analytic philosophy since it still directs our investigation of the relationship between language, logic, and knowledge.

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Cite this article

Dhibar, U. (2025). Frege's Theory of Meaning: Words, Sentences, and Their Significance. *Research Review Journal of Interdisciplinary Studies*, 1(2), 36-43.
<https://doi.org/10.31305/rrjis.2025.v1.n2.006>